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Evaluation of Crew Health

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The basic philosophy for STS-1 was couched in the premise that the flight was a vehicle checkout, therefore, the medical program was directed toward routine crew health maintenance and the implementation of a sophisticated Emergency Medical System, rather than the conduct of detailed physiologic evaluations pre and postflight. The STS-1 Medical Program was designed to protect and maintain flight crew health during all phases of the mission. This goal was accomplished by a program which encompassed the following elements: (1) Health Stabilization Program, (2) Critical Personal Reliability Program, (3) Pre and Postflight Medical Flight Crew Evaluations, (4) Inflight medical consultation availability via Mission Control Center (MCC) Surgeons, and (5) Implementation of an Emergency Medical System at all launch and recovery sites.

Physical examinations were conducted on F-30 (March 2, 1981), F-10 (March 31, 1981), Launch Day (April 10, 1981), Landing Day (April 14, 1981), and L+3 (April 17, 1981). See Table 2-1 for details.

The Crew Physician (Craig L. Fischer, M.D.) and Deputy Crew Physician (Joseph Degioanni, M.D.) performed all pre and postflight physical examinations. Each physician had the opportunity to examine both crewmen preflight (F-30 and F-10) and the same crewman post landing as he examined on launch morning.

Results and Discussion

The preflight interval was complicated by an on-pad mission abort in the final moments of countdown. The crew had been in the launch position for approximately six hours by the time this malfunction was encountered and it was decided that the launch had to be recycled in 48 hours. The second countdown went quite smoothly and the launch was nominal. It should be noted that the crew remained in good spirits throughout this unprogrammed delay and remained at a high level of readiness. Conversation with both crewmembers revealed that six hours in the launch position is at the level of tolerance from a comfort standpoint. This is in agreement with a pre-mission estimate and mission rule limiting the crew residence time to six hours in the launch position. No significant medical problem occurred in the preflight interval.

Unlike previous space flights, the crew re-entered in the seated position, thereby pulling re-entry G in the G_z axis. This fact, coupled with an active crew role in the Orbiter re-entry sequence, necessitated the donning of anti-G garments prior to re-entry with the crew prepared to inflate them if any presyncopal signs occurred.

The re-entry G profile was nominal and at no time did the crew report any adverse effects of G loading. After landing, minor difficulty was experienced in extracting the crew from the Orbiter due to toxic fumes outside the vehicle in the hatch area. This problem was solved by repositioning the wind machine. Hatch opening occurred one hour and twenty minutes after wheel stop. During the post landing wait for hatch opening, the Commander got quite warm and injected cool water into his space suit from the water gun located on the mid deck. The Pilot, however, was comfortable. This may be a reflection on the fact that the Pilot was not as physically active postflight as the Commander. The Pilot remained on the flight deck whereas the Commander had responsibilities which required that he move between the flight and mid-decks.

After removal from the Orbiter both crewmen walked without difficulty and experienced no untoward symptomatology. Desuiting occurred in the crew van on the way back to the flight line exam facility. Although the Commander was drenched, both crewmen doffed their suits easily. Neither crewman had anything to eat or drink in the crew van and did not complain of thirst.

Concluding Remarks

No significant clinical problem was identified postflight. Of interest medically was the expected hyperreflexia and dependent venous stasis exhibited by both crewmen.

Table 4-1

STS-1 Pre and Postflight Medical Evaluations

EXAM	F-30 DAYS	F-10 DAYS	F-2 DAYS	F-0	L+0	L+3 DAYS	L+3 to L+7 DAYS
LOCATION	JSC	JSC	JSC	KSC	DFRC	JSC	JSC
APPROXIMATE DURATION	1:05	1:55	0:15	0:10	0:30	1:45	
EXAM COMPONENTS	LM PX D V T	LM ST PX A	LM	PX	LM STW PX	ST D V T A PX	T–38 CHECK OUT

LEGEND:

A – Audiometry
D – Dental Examination
LM – Laboratory–Microbiology
PX – Physical E..amination
ST – (Cardiovascular) Stress Tests, including 80% treadmill
STW – Stand Test–Weight
T – Tonometry
V – Visual Examination